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| EXAMINER | |
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| SELBY, GEVELL V | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) |
|---|---|---|
| | 10/807,471 | IBE, HIROSHI |
| | Examiner | Art Unit |
| | Gevell Selby | 2622 |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

## Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

**2. Claims 1-4, 7, 8, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li, US 6,587,147, in view of Takada et al., US 6,661,458 and Tokumitsu et al., US 6,008,511.**

In regard to claims 1 and 8, Li, US 6,587,147, discloses an electronic color camera comprising:

an image-forming optical system (see figure 1, element 130);

and a color-image pickup device (see figure 1, elopement 105) optically coupled to said image-forming optical system (see column 3, lines 15-17); wherein said color-image pickup device includes:

a color filter unit (see figure 2, element 178) which includes R filters, G filters, B filters, and wherein the R filters determine a lower wavelength limit of the red wavelength range, the G filters determine the green wavelength range, the B filters determine the blue wavelength range (see column 3, line 65 to column 4, line 3), an optical element (see figure 2, element 174) for infrared blocking and determining an upper wavelength limit of the red wavelength range (see column 3, lines 55-59),

for decomposing light into a first component in a red wavelength range, a second component in a green wavelength range, and a third component in a blue wavelength range (see column 4, lines 55-63);

an image pickup unit (see figure 1, element 105) which is placed in a stage following said color filter unit, includes a plurality of photoelectric conversion elements (see figure 8, elements 215) being arranged in a light-reception area to receive said first, second, and third components, picks up an optical image from the first, second, and third components received by the plurality of photoelectric conversion elements, and outputs picture signals corresponding to the first, second, and third components (see column 3, lines 14-13);

a color-picture-signal generation unit (see figure 1, element 114) which generates a color-picture signal based on said picture signal outputted from said image pickup unit (see column 3, lines 23-30); and

a transmittance distribution means (see figure 1, element 130for realizing a spatial distribution of a ratio of a transmittance of said first component received by ones of said plurality of photoelectric conversion elements arranged in each portion of said light-reception area to a transmittance of each of the second and third components received by ones of the plurality of photoelectric conversion elements arranged in each said portion of the light-reception area (see column 3, lines 14-17).

The Li reference does not disclose wherein the optical element is a dielectric multilayer film and the dielectric multilayer film determines an upper wavelength limit of the red wavelength range and so that the ratio increases with a distance from a center of said light-reception area to each said portion of the light-reception area.

Takada et al., US 6,661,458, teaches to form an infrared cutoff filter from interference filters that utilize a dielectric multilayer film, thereby minimizing the thickness of the filters.

It would have been obvious to one of ordinary skill in the art at the time of invention to have been motivated to modify Li, US 6,587,147, in view of Takada et al., US 6,661,458, to have the optical element be a dielectric multilayer film, in order to minimize the thickness of the filters to make a smaller device.

Tokumitsu et al., US 6,008,511, discloses a solid-state image sensor with microlenses that are disposed to shift their centers from aperture centers of the pixels by first shift amounts (offset amounts) in a direction toward the chip center or chip peripheries, to minimize the shading in the peripheries for each color output individually (see abstract column 2, lines 20-33).

It would have been obvious to one of ordinary skill in the art at the time of invention to have been motivated to modify Li, US 6,587,147, in view of Takada et al., US 6,661,458, and Tokumitsu et al., US 6,008,511, to have microlenses that are disposed to shift their centers from aperture centers of the pixels by first shift amounts so that the ratio increases with a distance from a center of said light-reception area to each said portion of the light-reception area, in order to minimize shading.

In regard to claim 2, Li, US 6,587,147, in view of Takada et al., US 6,661,458, and Tokumitsu et al., US 6,008,511, discloses the color-image pickup device according to claim 1. The Tokumitsu reference discloses wherein said ratio is increased by increasing the transmittance of the first component received by each said of the plurality of photoelectric conversion elements with the distance from the center of said light reception area to each said portion of the light reception area (see column 3, line 65 to column 4, line 16: the microlenses are shifted more the further distance from the center to increase the transmittance).

In regard to claims 3 and 4, Li, US 6,587,147, in view of Takada et al., US 6,661,458, and Tokumitsu et al., US 6,008,511, discloses the color-image pickup device according to claims 1 and 2, respectively. The Tokumitsu reference discloses wherein each of said R filters has a transmittance which increases with a distance from said center of the light-reception area to each of said R filters so that the R filters realize the transmittance distribution means (see column 3, line 65 to column 4, line 16: the microlenses are shifted more the further distance from the center to increase the transmittance; the first color filter is an R, G, or B).

In regard to claims 7 and 10, Li, US 6,587,147, discloses an electronic color camera comprising:

an image-forming optical system (see figure 1, element 130);

and a color-image pickup device (see figure 1, element 105) optically coupled to said image-forming optical system (see column 3, lines 15-17);

wherein said color-image pickup device includes:

a color filter unit (see figure 2, element 178) which includes R filters, G filters, B filters, and wherein the R filters determine a lower wavelength limit of the red wavelength range, the G filters determine the green wavelength range, the B filters determine the blue wavelength range (see column 3, line 65 to column 4, line 3), an optical element (see figure 2, element 174) for infrared blocking and determining an upper wavelength limit of the red wavelength range (see column 3, lines 55-59), for decomposing light into a first component in a red wavelength range, a second component in a green wavelength range, and a third component in a blue wavelength range (see column 4, lines 55-63);

an image pickup unit (see figure 1, element 105) which is placed in a stage following said color filter unit, includes a plurality of microlenses (see figure 8, element 300) and a plurality of photoelectric conversion elements (see figure 8, elements 215) being arranged in a light-reception area to receive said first, second, and third components through the plurality of microlenses, and outputs picture signals corresponding to the first, second, and third components (see column 3, lines 14-13);

a color-picture-signal generation unit (see figure 1, element 114) which generates a color-picture signal based on said picture signal outputted from said image pickup unit (see column 3, lines 23-30); and

wherein relative positions between each of said plurality of photoelectric conversion elements and one of said plurality of microlenses

> corresponding to the photoelectric conversion element are set in such a manner that a ratio of light-reception efficiency of the first component received by ones of said plurality of photoelectric conversion elements arranged in each portion of said light-reception area to light-reception efficiency of the second and third components received by ones of the plurality of photoelectric conversion elements arranged in each said portion of the light-reception area increases with a distance from a center of the light-reception area to each said portion of the light-reception area (see column 3, lines 14-17).

The Li reference does not disclose wherein the optical element is a dielectric multilayer film and that the ratio increases with a distance from a center of said light-reception area to each said portion of the light-reception area.

Takada et al., US 6,661,458, teaches to form an infrared cutoff filter from interference filters that utilize a dielectric multilayer film, thereby minimizing the thickness of the filters.

It would have been obvious to one of ordinary skill in the art at the time of invention to have been motivated to modify Li, US 6,587,147, in view of Takada et al., US 6,661,458, to have the optical element be a dielectric multilayer film, in order to minimize the thickness of the filters to make a smaller device.

Tokumitsu et al., US 6,008,511, discloses a solid-state image sensor with microlenses that are disposed to shift their centers from aperture centers of the pixels by first shift amounts (offset amounts) in a direction toward the chip center or chip

peripheries, to minimize the shading in the peripheries for each color output individually (see abstract column 2, lines 20-33).

It would have been obvious to one of ordinary skill in the art at the time of invention to have been motivated to modify Li, US 6,587,147, in view of Takada et al., US 6,661,458, and Tokumitsu et al., US 6,008,511, to have microlenses that are disposed to shift their centers from aperture centers of the pixels by first shift amounts so that the ratio increases with a distance from a center of said light-reception area to each said portion of the light-reception area, in order to minimize shading.

**3. Claims 5, 6, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi, US 5,406,391, in view of Takada et al., US 6,661,458, and Kwon, US 5,432,550.**

In regard to claims 5 and 9, Li, US 6,587,147, discloses an electronic color camera comprising:

an image-forming optical system (see figure 1, element 130);

and a color-image pickup device (see figure 1, element 105) optically coupled to said image-forming optical system (see column 3, lines 15-17);

wherein said color-image pickup device includes:

a color filter unit (see figure 20, element 143) which includes R filters, G filters, B filters, and wherein the R filters determine a lower wavelength limit of the red wavelength range, the G filters determine the green wavelength range, the B filters determine the blue wavelength range (see column 13, lines 26-29), an optical element (see figure 20, element 142) for infrared blocking and determining an upper wavelength limit of

the red wavelength range, for decomposing light into a first component in a red wavelength range, a second component in a green wavelength range, and a third component in a blue wavelength range (see column 13, lines 22-24);

an image pickup unit (see figure 20, element 44) which is placed in a stage following said color filter unit, includes a plurality of photoelectric conversion elements being arranged in a light-reception area to receive said first, second, and third components, picks up an optical image from the first, second, and third components received by the plurality of photoelectric conversion elements, and outputs picture signals corresponding to the first, second, and third components (see column 13, lines 26-29);

an amplifier (see figure 20, element 145); and

a color-picture-signal generation unit (see figure 20, element 147) which generates a color-picture signal based on said first, second, and third picture signals amplified by said amplifier (see column 13, lines 30-33).

The Li reference does not disclose wherein the optical element is a dielectric multilayer film and the amplifier amplifies said first, second, and third picture signals in such a manner that a ratio of a first gain of the first picture signal corresponding to said first component received by ones of said plurality of photoelectric conversion elements arranged in each portion of said light-reception area to each of second and third gains of

said second and third picture signals corresponding to said second and third components received by ones of the plurality of photoelectric conversion elements arranged in each said portion of the light-reception area increases with a distance from a center of the light-reception area to each said portion of the light-reception area;.

Takada et al., US 6,661,458, teaches to form an infrared cutoff filter from interference filters that utilize a dielectric multilayer film, thereby minimizing the thickness of the filters.

It would have been obvious to one of ordinary skill in the art at the time of invention to have been motivated to modify Li, US 6,587,147, in view of Takada et al., US 6,661,458, to have the optical element be a dielectric multilayer film, in order to minimize the thickness of the filters to make a smaller device.

Kwon, US 5,432,550, discloses a camcorder with an automatic gain controller that compensates the difference of luminance between the side and the center of the camcorder screen (see column 1, line 41 to column 2, line 11)

It would have been obvious to one of ordinary skill in the art at the time of invention to have been motivated to modify Li, US 6,587,147, in view of Takada et al., US 6,661,458, and Kwon, US 5,432,550, to have the amplifier amplify said first, second, and third picture signals in such a manner that a ratio of a first gain of the first picture signal corresponding to said first component received by ones of said plurality of photoelectric conversion elements arranged in each portion of said light-reception area to each of second and third gains of said second and third picture signals corresponding to said second and third components received by ones of the plurality of photoelectric

conversion elements arranged in each said portion of the light-reception area increases with a distance from a center of the light-reception area to each said portion of the light-reception area, in order to minimize shading.

In regard to claim 6, Li, US 6,587,147, in view of Takada et al., US 6,661,458, and Kwon, US 5,432,550, discloses the color-image pickup device according to claim 5. The Kwon reference discloses wherein said ratio is increased by increasing said first gain of the first picture signal corresponding to said first component received by each of the plurality of photoelectric conversion elements with said distance from the center of said light reception area to each said portion of the light reception area (see column 4, lines42-49: the gain for all the pixel signal including the first pixel signal is increased away from the center of the image).

## ***Conclusion***

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 6,667471, discloses an imaging system with an electro-optic filter, image sensor and color filter.

US 6,292212, discloses a digital camera with a solid state color image sensor having an array of image sensing elements and an array of color filters including infrared filters.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gevell Selby whose telephone number is 571-272-7369. The examiner can normally be reached on 8:00 A.M. - 5:30 PM (every other Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivek Srivastava can be reached on 571-272-7304. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

gvs

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